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The following measurements are appended:

Dermal scale—	M.
Length0033
Breadth0025
Length of "carina" .....	.0037
Dorsal vertebra—	
Length of centrum .....	.075
Length of neural spine .....	.095
Breadth of neural spine, at base .....	.074
Breadth of neural spine, at tip .....	.039
Vertical diameter of cup .....	.058
Transverse diameter of cup .....	.071
Longest rib—	
Tip to tip .....	.381
Along curvature .....	.418
Breadth at base .....	.025
Breadth at tip .....	.009
Breadth at center .....	.012
Femur—	
Length .....	.132
Breadth at proximal end .....	.082
Breadth at distal end .....	.073
Breadth at center .....	.050
Front paddle—total length .....	.726
Coracoid—	
Length .....	.118
Breadth at proximal end .....	.131
Curvature at proximal end .....	.195
Breadth at distal end .....	.056
Distance of perforation from outer edge .....	.026
Distance of perforation from inner edge .....	.042
Humerus—	
Length .....	.122
Breadth at proximal end .....	.074
Breadth at distal end .....	.080
Ulna—	
Length .....	.093
Breadth, proximal .....	.041
Breadth, distal .....	.063
Radius—	
Length .....	.094
Breadth, proximal .....	.047
Breadth, distal .....	.041

In the plates which accompany this article, the dermal scales are represented of natural size, and the slab containing the bones is reduced to one-ninth its natural dimensions.

THE IOLA (KANSAS) MINERAL WELL.

By Prof. William K. Kedzie.

At the request of the proprietors, I visited this interesting phenomenon during the month of June, 1876, for the purpose of collecting a supply of

water for a thorough analysis. The so-called "well" is, as is well known, simply an old boring by coal prospectors. Its total depth is 736 feet. When at the depth of 626 feet the diamond drill with which the boring was made, suddenly dropped some twenty inches through an apparently vacant seam. A violent upward rush of water and gas immediately began through the tube, and with more or less irregularity has since continued without cessation. The boring is tubed to the depth of 149 feet only. The water is expelled by the elastic force of the gas in very irregular pulsations, at varying intervals alternately first with great impetus and then with a succession of fainter impulses. The sections of the core obtained during the boring present, when arranged in order, a most interesting view of the geological section of this region; especially instructive as it occurs over the Lower Coal Measure area of this State. The water of the well is, of course, largely charged with mineral matters, a portion of which being held in solution by the free carbonic acid with which the water abounds, is deposited as a thick sediment upon allowing the water to stand for some time freely exposed to the open air. By repeated and careful experiments, I determined the temperature of the water to be uniformly 61° F., as from the great depth from which the water rises it exhibits little or no variation in temperature through summer or winter. A full analysis of the water presents the following results: Specific Gravity, 1.0138. Temperature, 61° F. Total Mineral Matter to the Imperial Gallon, 1100.081 grains. Carbonic Acid Gas, 145.881 cub. in.

Sodium Chloride	971.506 Grains.
Potassium Chloride	17.909 "
Magnesium Chloride	7.305 "
Sodium Bi-carbonate	8.158 "
Calcium Bi-carbonate	60.687 "
Magnesium Bi-carbonate	25.485 "
Iron Bi-carbonate	3.939 "
Silica .....	.602 "
Sodium Iodide	Distinct Traces.
Sodium Bromide	Abundant "
Organic Matter	2.000 Grains.
Suspended Matter	3.500 "
Total	1100.081 Grains.

The results of the above analysis have been in all cases duplicated, and in many cases triplicated. Like the product of all mineral wells, this water of course varies somewhat, within slight limits, in its composition. Thus in the water examined by me there was absolutely no trace whatever of sulphates, whereas I observe that Prof. G. E. Patrick, in his paper read before the Academy last year, reports the presence of a very small quantity of Sodium Sulphate. I notice, however, that Mr. Patrick also reports in his analysis an appreciable quantity of Ferric Chloride (Sesqui-Chloride of Iron). If this salt of iron is indeed present in this water it is a most remarkable fact, as there is no well authenticated analysis showing its existence in any mineral spring in the United States. My own analysis indicates no such condition, the iron being present in the water analyzed by me in its usual form in all mineral waters, viz., held in solution as the Bi-carbonate. For the purpose of comparison I give below a tabular view showing the composition of the Iola water as contrasted with that of two of the most noted of the Saratoga Springs, the "Congress" and the "United States."

IN GRAINS TO THE IMPERIAL GALLON.

	IOLA	CONGRESS	UNITED STATES
Bi-carbonate of Sodium	8.158	7.473	3.240
Bi-carbonate of Calcium	60.687	99.593	64.672
Bi-carbonate of Magnesium	25.485	72.152	43.192
Bi-carbonate of Iron	3.929	.248	.520
Bi-carbonate of Lithium .....	.....	2.992	3.040
Bi-carbonate of Barium .....	.....	.760	.752
Chloride of Sodium	971.506	400.440	141.872
Chloride of Potassium	17.909	8.048	8.604
Chloride of Magnesium	7.305	.....	.....
Sulphate of Potassium .....	.....	.888	.....
Phosphate of Sodium .....	.....	.016	.016
Iodide of Sodium	Traces.	.136	.048
Bromide of Sodium	Traces.	8.552	.848
Alumina .....	.....	Traces.	.096
Silica .....	.602	.840	3.184
Organic Matter	2.000	Traces.	Traces.
Cabonic Acid Gas (cubic inches)	145.891	432	240

The Iodide and Bromide of Sodium, though in minute amount, are present in very appreciable quantities in the water of the Iola well, and to their influence is undoubtedly due much of the asserted beneficial effects of this water upon scrofulous and other allied difficulties. The Carbonic Acid present in the Iola water is considerably less than that afforded in the waters of the Saratoga Springs, though an abundance is present to remove, by its sparkling influence, much of the disagreeable flavor of the water, which otherwise, from the large amount of mineral matter present, might prove somewhat unpleasant.

The gas which is thrown from the well with such force and in such quantity, is almost wholly made up of Light Carburetted Hydrogen, commonly known as "Marsh Gas." From its very slight solubility (1 part in 27 by volume, Storer), it of course exists in very small quantities only in the water itself, though it is constantly bubbling up through it. Notwithstanding the views of many observers and writers, the escape of this gas in such abundance from this well is neither anomalous nor startlingly unusual. It is no uncommon occurrence in many portions of the country in sinking similar borings for coal, salt or oil, to find this gas suddenly escaping with force sufficient to stop or reverse the engine. This Light Carburetted Hydrogen is produced in immense quantities in nature from the slow decomposition of all deposits of vegetable matter, and frequently escapes naturally in great abundance. The large supply of this gas near Fredonia, N. Y., by which the entire village is lighted, is too well known to need comment here. Near Oberlin, Ohio, is a spring from which I have frequently discovered the gas escaping in great quantity, forming, when lighted, a flame of large size. Near Kanawha, Va., and at many other places too numerous to mention, this same gas has been known to escape for years without cessation. It is this gas which constitutes the dreaded "fire damp" of our coal mines, the cause of all the terrible disasters and explosions with which the history of coal mining is filled. Points from which it escapes in much the same manner as at Iola, without the efflux of water, are known to the miners as "blowers," and are liable to suddenly appear at any time upon opening a new seam.

Nor, upon the other hand, is it at all necessary, in endeavoring to explain the origin of such large quantities of this gas as escape from the Iola

boring, to resort to the popular but very improbable hypothesis of the decomposition of the coal itself by the agency of heat; especially inapplicable to this uniformly undisturbed portion of the Lower Coal Measure of Kansas. There is no evidence to show that this vacant seam of twenty inches encountered at this great depth was originally occupied by a coal bed at all, and such a supposition is not in any way essential. There can be no doubt but that this opening, whether produced by flexure of lower strata or otherwise, communicates laterally with a very large tract of coal-bearing formations, possibly with a good portion of the Western Interior Coal area. And when we remember the fact that this Light Carburetted Hydrogen is given off in large quantities from many varieties of bituminous coal at ordinary temperatures, we need be at no loss to account for its appearance at this opening in such considerable amount. It is from this cause that the gas accumulates in coal mines in such dangerous quantities; and it is by no means impossible that this Iola boring may serve as the "vent hole" for a considerable area of coal-bearing territory. This escape of Light Carburetted Hydrogen from soft bituminous coal at ordinary temperatures is of course a continuation of the original coal-forming process; a slow decomposition of vegetable matter under a very limited supply of atmospheric oxygen, in which the gaseous products are principally Light Carburetted Hydrogen with Carbonic Acid (di-oxide), small portions of Carbonic Oxide and occasionally still smaller quantities of free Hydrogen. The appearance of the Light Carburetted Hydrogen in so liberal quantities at the Iola well, as also the composition of the water brought up by the pulsations of the gas itself, are both matters of very great scientific interest; but neither their interest nor their importance are in any way augmented by ascribing miraculous properties to the one or an anomalous origin to the other.

THE INSECTS OF WALLACE COUNTY, KANSAS.

By Prof. F. H. Snow, of the University of Kansas.

The Kansas University Scientific Expedition for 1877, in charge of the writer, spent three weeks in camp along the Smoky Hill river, about one mile from Fort Wallace. The elevation of this locality, above the level of the sea is about 3,700 feet. Wallace county is the extreme western county of the State, along the line of the Kansas Pacific Railway. The railway station is 420 miles, by rail, from Kansas City, and 219 miles from Denver. Our collecting ground was therefore very near the center of the plains, or of what was once known as the Great American Desert. The expedition for 1878 spent one month (June 12th to July 12th) in Gove and Wallace counties. Gove county adjoins Wallace county on the east, and the altitude of the railway station at Buffalo is about 3,300 feet above the level of the sea. As the two counties are contiguous, and as their faunal characteristics are apparently identical, the collections of both expeditions are combined in one list. Species taken in Wallace county alone, are marked "W."; those taken in Gove county, alone, are marked "G.", and those taken in both counties are not marked for locality. In the present paper, I include only the orders Lepidoptera and Coleoptera.

My assistants in 1877, were Messrs. Richard Foster and John M. Walker; in 1878, Richard Foster and Louis L. Dyeche. To their indefatiga-